ENABLE-IT ETHERNET EXTENSION EXPERTS

Enable-IT 864P
Mini DSLAM
PoE Ethernet Extender Kit
User Manual

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ABOUT THIS USER MANUAL

This product User Manual provides all the information needed to install and use the Enable-IT 864P Mini Extended Ethernet PoE DSLAM. This User Manual is intended for use by technicians who are responsible for installing and setting up network equipment. Consequently, it is assumed that the installer has a basic working knowledge of LANs (Local Area Networks), PoE (Power-over-Ethernet) and voice telecom wiring.

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INTRODUCING THE 864P MINI DSLAM POE ETHERNET

Congratulations on purchasing Enable-IT's 864P Mini Extended Ethernet PoE DSLAM — the simplest method to stretch your broadband solutions for in-building deployment in commercial office buildings, hotels, and multi-tenant residential units.

The 864P Mini PoE DSLAM product offers the lowest cost solution in a simple design for rapid install using existing 1-pair Telco wiring.

This chapter contains introductory information about the 864P Mini Extended Ethernet PoE DSLAM and how it can be used in your network. It covers the following topics:

- About the 864P Mini Extended Ethernet PoE DSLAM
- Key Benefits
- Summary of Features
- Typical Applications

About The 864P Mini Extended Ethernet PoE DSLAM

The 864P Mini PoE DSLAM solution addresses the problem of high costs associated with stretching your backbone with traditional fiber or a series of hubs/repeaters.

In many office buildings, preferred network access is a dedicated Ethernet line, however, Ethernet over twisted pair wiring has a distance limitation of 328ft. In order to drive Ethernet signal further, one would have to add repeaters to each segment of 328ft twisted pair cabling; this is often insufficient and too costly in multi-story buildings. Fortunately, the Enable-IT 864P Mini PoE DSLAM Series extended Ethernet solutions can push the reach of Ethernet to more than (19) nineteen times the typical Ethernet distance over a 1-pair Telco wiring infrastructure or better.

A simple design methodology would be to think of the 864P Mini PoE DSLAM extending a standard Ethernet line up to 6,000ft (1,829m) with a 4-Port 10/100 Ethernet switch, and can also include dual voice lines simultaneously.

To increase the durability and extended use of the product providing maximum future technology protection, the 864P Mini Extended Ethernet PoE DSLAM meets the challenge of modern switched LANs, and allows you to add features and capacity as your network expands. The Enable-IT 864P Mini PoE DSLAM extended Ethernet solution has been tested to provide Full-Duplex transport up to 90Mbps over CAT2, and up to 100Mbps over CAT5e cabling.

Unit Model	Wiring	LAN Data Rate	Max. Distance
860 Pro	1-pair CAT2, up to CAT7	100Mbps FD	6,000ft (1,829m)

Up to 700ft (213m) - 100Mbps
700ft (213m) to 1,350ft (411m) - 90Mbps
1,350ft (411m) to 1,970ft (600m) - 70Mbps
1,970ft (600m) to 2,625ft (800m) - 52Mbps
2,625ft (800m) to 3,280ft (1000m) - 42Mbps
3,300ft (1006m) to 6,000(1,829m) - 30Mbps

* Actual data rate will vary on the quality of the copper in the wire, twisted vs. straight pair and environmental electromagnetic interference factors.

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Key Benefits

The following list identifies the 864P Mini Extended Ethernet PoE DSLAM key benefits.

- Dramatic cost reduction over any competing technology and includes a 4-Port 10/100 LAN switch on each end. Rapid installation with small box profile, no programming and no firmware to upgrade
- Broadband technology that delivers in-building Ethernet access over 1-pair of existing Category 2, up to Category 5e, 6 or 7, wiring at a maximum distance of 6,000ft (1,829m). Existing spare or actively in use for analog wiring can be used as well. This means no new wiring is required.
- Provides one scalable infrastructure for Internet access, POTS, VoIP, video, and virtual private networking (VPN).
- Low profile box capable of supporting Ethernet data all in a single RJ-45 Ethernet jack (Interlink port). At time of ordering, or afterwards, a RJ-45 dongle can be requested to use on RJ-11 telephone wiring.
- 861P PoE CPE - Quad switched RJ-45 10/100 LAN Ethernet ports for expansion without adding a hub or switch on each end.

Summary Of Features

The Enable-IT 864P Mini Extended Ethernet PoE DSLAM has the following hardware features:

- Extended Ethernet line over existing CAT2 up to CAT5e / CAT7 wiring
- Uses RJ-45 Interlink port for transport (dual voice, 100Mbps data and PoE)
- Rapid Telco style installation – no programming required
- Supports digital VoD channels and maintains existing telephone (lifeline POTS)
- Drives Ethernet 100Mbps Full-Duplex service delivery with quad LAN switch, dual voice up to 6,000ft (1,829m) - can also transport PoE up to 2,500ft natively.
- Network equipment independence – transparent to protocols/applications/MAC

Specifications:

Power Indicator
100Mbps Link Status/Activity
VDSL2 Link Status/Activity

Functionality:

Data Rates 10/100Mbps Full-Duplex
Full-Duplex/Half-Duplex Status/Collisions
Protocol independent

Physical Dimensions:

Height: 1.5" (38.1mm)
Depth: 3.5" (88.9mm)
Width: 4.26” (108.2mm)
Weight: .4lbs (6.4oz) 2.5lbs

864P Mini PoE DSLAM Interlink ports:

Pins 1 & 2 – Voice line 1 and Ethernet data
Pins 3 & 6 – Voice line 2 (optional)
Pins 4 & 5 – optional support for PoE
Pins 7 & 8 – optional support for PoE

Environment:

Operating temp: -49°F to 168°F (-45°C to 76°C)
Storage temp: -49°F to 168°F (-45°C to 76°C)
Humidity 5% to 95%, non-condensing

Interfaces:

(1) 5v 4A DC Power Adapter 2.1mm
(2) RJ-45 100Mbps LAN Auto negotiate
(4) RJ-45 Interlink port

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Typical Use Applications

The Enable-IT, Inc. 864P Mini Extended Ethernet PoE DSLAM are usually installed into telephone wiring infrastructures where extension of backbone services is required and expensive fiber options are prohibitive. The 864P Mini Extended Ethernet PoE DSLAM allows a standard Ethernet segment to be deployed quickly over existing 1-pair Telco copper wiring in combination with existing POTS voice signals. The 864P Mini PoE DSLAM Interlink ports (RJ-45 interface) carries this 1-pair signaling over the RJ-45 pins 1 & 2 - used as transport for both voice and data. If you use more than 1-pair of wiring, such as a CAT5 segment, the RJ-45 (pins 3 & 4) are used for voice line 2, and the remaining pins (4,5,7 & 8) can transport native 802.3af PoE, or are unused. Quad switched RJ-45 10/100 auto-sensing ports allow the use of LAN devices without adding an Ethernet hub or switch to either end. An optional RJ-45 dongle can be used in unison with the RJ-45 Interlink wiring as DSL filters to clean up noise bleeding over your cabling, as well as combined use for RJ-11 Telephone connections.

Installers have the convenience of a 100Mbps LAN Ethernet unit for peace of mind connectivity and no device maintenance. Rapid installation allows for minimal interruption, and the Broadband technology allows for investment protection up to 10 -15 years with no firmware or replacement issues. Bandwidth can be scaled according to the Broadband access provider needs. The 864P Mini PoE DSLAM is a passive device so interruption of Internet service does not affect POTS services. Carriers and access providers can come and go, but the 864P Mini PoE DSLAM extended Ethernet technologies continue to provide lasting value, such as other utilities like water, gas and electricity.

The Enable-IT 864P Mini Extended Ethernet PoE DSLAM is suited for the following key environments:

- Commercial Buildings (Multi-Tenant Units)
- Business Parks (Multi-Tenant Units)
- Apartments (Multi-Residential Units)
- Hotels (Multi-Hospitality Units)
- Business Suites (Multi-Hospitality Units)
- School Campuses (University, K-12)
- College Housing (Multi-Residential Units)
- Mining Operations – Quarries, Mine Shafts
- Nautical Infrastructure – Cruise Ships, Marinas, Dive Operations, Submarines
- Video Surveillance/Security
- WiFi Deployment – ISP's, RV Parks, Construction Sites
- Manufacturing – Foundries, Pharmaceutical, Aerospace, Automotive, Petroleum, Concrete Plants, etc.
- Retail POS – Department stores, Bars, restaurants, retail spaces
- Government – Naval ships, FEMA, Housing, USGS, National Parks, Forestry, Research Stations, NASA, Utilities, etc.
- Education – Outdoor Camps, College & University Campuses
- Healthcare – Hospitals, Elder Care, Outpatient Facilities
- Entertainment – Movie theaters, Home Entertainment, Fairs, Outdoor Venues

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INSTALLING THE 864P MINI POE DSLAM

The Enable-IT 864P Mini PoE DSLAM has a distance restriction of 6,000ft (1,829m) over 1-pair of Category 2, up to 4-pair CAT5e / CAT7, wiring from device extension to device extension. Therefore quick, simple site surveys and installation planning are highly recommended.

This chapter describes the recommended installation process for the Enable-IT 864P Mini Extended Ethernet PoE DSLAM. The following topics are covered:

- Site Plan – Installation Design Considerations
- Unpacking the Enable-IT 864P Mini Extended Ethernet PoE DSLAM
- Perform an Out Of The Box Test (OOTBT)
- Performing the On-Site Installation

Site Plan – Installation Design Considerations

The planning process should involve a site walk-through and discovery survey. Electrical cable measurement tools are the most reliable method to determine the longest run of hidden wiring. Estimate the best locations to position the Broadband concentrators to adequately reach desired connectivity on each floor. Document your findings to use in designing a network topology to support the Ethernet switches and backbone connectivity. The following are key points to remember in the site survey:

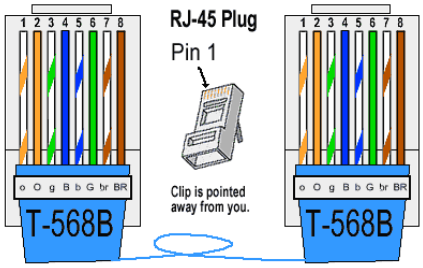
- Total distance limitation of 6,000ft (1,829m) from end-to-end.
- 1-Pair CAT2 wiring, or 4-pair CAT5e, .30 gauge, or better, cabling is required for the 864P Mini PoE DSLAM Interlink ports transmission.

For the Interlink wiring you will need to use RJ-45 connectors. Crimp a RJ-45 Male head to each end of the contiguous wire run and use pins 1 & 2 straight through. This will deliver 1 voice line, and Ethernet data. If you desire to use the second voice line, you can also use pins 3 & 6 on each end straight through.

The 864P Mini PoE DSLAM Interlink ports (RJ-45) carries this 1-pair signaling over the RJ-45 pins (1 & 2) - used as transport for both voice and data. If you use more than 1-pair of wiring, such as a CAT5 segment, the RJ-45 pins 3 & 4 are used for voice line 2, and the remaining pins (4,5,7 & 8) can transport native 802.3af PoE, or are unused. As an option, telephone dongles can be provided for use with existing RJ-11 wiring.

861P PoE CPE

864P Mini PoE DSLAM



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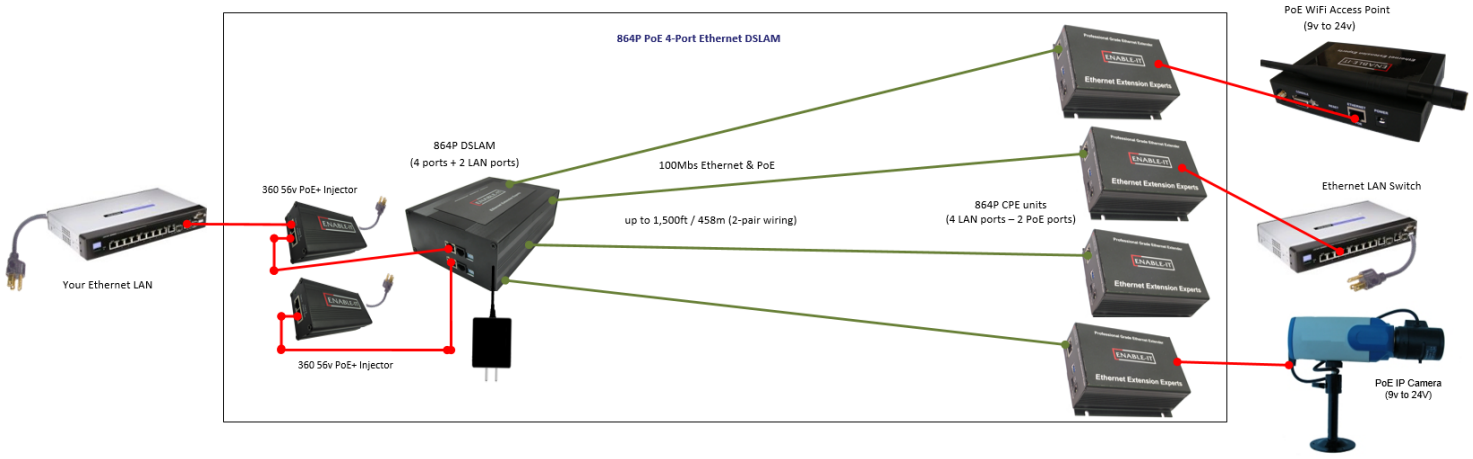
Unpacking the Enable-IT 864P Mini Extended Ethernet PoE DSLAM

Carefully remove the Enable-IT 864P Mini PoE DSLAM packing materials from the box. Verify that the items listed below are present. Make sure that the equipment supplied matches what you ordered. If any items are missing or damaged, please contact Enable-IT or your distributor for assistance.

- (1) Enable-IT 864P Mini PoE DSLAM
  - 5v AC/DC Country Specific Power adapter
  - 10ft Ethernet LAN patch cables, Black
  - (2) Enable-IT 360 PoE Injectors
- (1) Enable-IT 864P Mini Extended Ethernet PoE DSLAM Quickstart Guide

Perform an Out of the Box Test (OOTBT)

We highly recommend a quick test to ensure the working order of you 864P PoE DSLAM. First power on the 864P with the supplied power cord. Next, take the 360 PoE Injector provided and power on the unit. Then connect the injector to LAN 1 on the 864P. Use one of the Ethernet patch cords provided and attach to the 864P Interlink port to each 861P PoE CPE unit. Your 861P CPE units should now be powered on. The Green Sync LEDs will start flickering slowly and then fast as the units talk to each other. After a few seconds you should see a solid Green Interlink Sync LED on each unit to confirm a link is established. This confirms basic proper operation of the units. Next for a more detailed test and to confirm your LAN Equipment works with the 864P, connect your Ethernet LAN to the 864P LAN ports and your Ethernet LAN at the remote CPE end and test connectivity. The Green Interlink Sync LED will pulse rapidly as it detects traffic.


864P PoE 4-Port Ethernet DSLAM
PoE WiFi Access Point
(9v to 24v)
864P DSLAM
(4 ports + 2 LAN ports)
100Mbs Ethernet & PoE
360 56v PoE+ Injector
up to 1,500ft / 458m (2-pair wiring)
864P CPE units
(4 LAN ports – 2 PoE ports)
Ethernet LAN Switch
Your Ethernet LAN
360 56v PoE+ Injector
PoE IP Camera
(9v to 24V)

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LED indicators will provide visual operational status of the 864P Mini PoE DSLAM and 861P PoE CPE.

Mode – Yellow Solid LED
Off = CO unit
On = CPE unit
Sync – Green slow to fast flicker LED on power up – indicates negotiation of a link
– Green solid LED indicates link established and rapid pulse is traffic
Act – Yellow LED
Off = No device attached or detected
On = Solid, indicates the presence of local LAN
On = Blinking, indicates the presence of local LAN traffic
Pwr – Green Solid LED indicates the unit is receiving 5v power

Performing the On-Site Installation

After removing the Enable-IT 864P Mini Extended Ethernet PoE DSLAM from the box, and performing the Out Of The Box Testing (OOTBT), all that remains to install the unit on-site is to mount the unit, build the interconnect wiring, add voice lines if needed, and attach the LAN device cabling with the provided Ethernet Patch cords.

❶ Mounting the Enable-IT 861P PoE CPE Ethernet Extender Units

The Enable-IT 861P PoE Ethernet Extender CPE are designed for quick wall mounting. Choose a location to mount each of the Enable-IT 861P PoE CPE where the maximum distance does not exceed 6,000ft (1,829m) total between devices to be connected. When wall-mounting the Enable-IT 864P Mini PoE DSLAM unit it is recommended that you use the appropriate screw anchors for your mounting surface. If mounting on existing plywood use wood screws; if mounting onto drywall or sheetrock, use plastic drywall anchors to secure your installation.

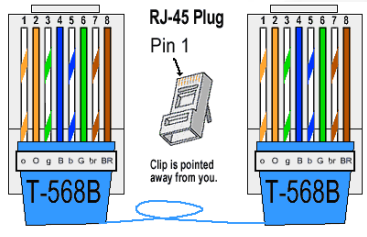
❷ Building the 864P Mini PoE DSLAM Interlink Wiring

The most important aspect of the installation is the correct wiring of the Interlink cabling.

The 864P Mini PoE DSLAM Interlink port (RJ-45 interface) carries this 1-pair signaling over the RJ-45 (pins 1 & 2) - used as transport for both voice and data. If you use more than 1-pair of wiring, such as a CAT5 segment, the RJ-45 (pins 3 & 4) are used for voice line 2, and the remaining pins (4,5,7 & 8) can transport native 802.3af PoE, or are unused.

For all wiring you will need to crimp a RJ-45 Male head to each end of the contiguous wire run and using the following (pins 1 & 2) straight through. This will deliver 1 voice line, and Ethernet data. If you desire to use the second voice line, you will need to request our optional dongle that will allow for connecting telephone lines to this interlink wiring. Insert the completed RJ-45 ends into the 864P Mini PoE DSLAM Interlink port on each 861P PoE CPE unit.

864P Mini PoE DSLAM



861P CPE

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❸ Cabling Devices To The Enable-IT 864P Mini PoE DSLAM Extended Ethernet Kit
Attach your remote LAN device to the 864P Mini PoE DSLAMCPE unit LAN ports with Ethernet patch cord provided. Attach your local LAN to the 864P Mini PoE DSLAMCO LAN ports with Ethernet patch cord provided. Attach the power adapters to both 864P Mini PoE DSLAM units.

Attach your local Interlink cabling end to the 864P Mini PoE DSLAM Interlink ports – Then do the same for the remote end and plug into the 864P Mini PoE DSLAMCPE unit Interlink port. The Sync LED's will flicker in a sequence, talking to each other until they go solid. Your equipment should now be powered up and functioning.

LED indicators will provide visual operational status of the 864P Mini PoE DSLAM and 861P PoE CPE.

Mode – Yellow Solid LED
Off = CO unit
On = CPE unit
Sync – Green slow to fast flicker LED on power up – indicates negotiation of a link
– Green solid LED indicates link established and rapid pulse is traffic
Act – Yellow LED
Off = No device attached or detected
On = Solid, indicates the presence of local LAN
On = Blinking, indicates the presence of local LAN traffic
Pwr – Green Solid LED indicates the unit is receiving 5v power

❹ Troubleshooting
First examine the backbone wiring pair and make sure you have solid connections. The Interlink Sync LED will be lit solid Green with rapid pulsing on each 864P Mini PoE DSLAM to show proper connection and pairing. If the Interlink Sync LED Link is flashing slow to fast and never goes solid…. Then follow the steps below:

1) Make sure your wiring is straight through and not connected to any Telco punch down blocks; If so remove from the block and use Telco butt clips to bridge wire.
2) Check for a firm connection of the RJ-45 connections in each 864P Mini PoE DSLAM unit, and power is applied to the 864P Mini PoE DSLAM & 861P PoE CPE units.
3) **You can easily isolate any issue by performing an Out of the Box Test (OOTBT). This test will confirm the correct working order of your Enable-IT 864P Mini Extended Ethernet PoE DSLAM. This will point to a possible issue with your long distance Interlink wiring being affected by possible outside interference.**

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Performance Settings (DIP Switch)

If you are experiencing performance issues with your Ethernet connection you may use the following DIP switch settings to adjust your application. For DIP switch 2-4 you must toggle both symmetrically, in other words the 864P and 861P PoE CPE must match. If you turn DIP switch 3 Up (Off) on the CO, then you must do so for the CPE and vice-versa.

- Switch 1: CO / CPE Mode
  CO Mode – Up / Off Position
  CPE Mode – Down / On Position
  Central Office Equipment (CO) is generally the equipment residing at the Carrier Telephone office or the head end of a circuit. Customer Premise Equipment (CPE) is generally the equipment residing on the customer side of a circuit. Typically you would place the CO at the local end and the CPE at the remote end for reference only. CO's only communicate with CPE's.

- Switch 2: Interleaved / Fast Channel
  Interleaved Channel – Up / Off Position
  Fast Channel – Down / On Position (Default)
  Interleaved channel works better for file transfers, where the delivered data must be error free but latency incurred by the retransmission of error packets is acceptable. Fast channel is preferred for streaming multimedia, where an occasional dropped bit is acceptable, but lags are less so.

- Switch 3: Asymmetrical / Symmetrical Mode
  Asymmetrical Mode – Up / Off Position
  Symmetrical Mode – Down / On Position (Default)
  Asymmetrical mode weighs in favor of download speed while sacrificing upload speed bandwidth. Symmetrical will balance out the download/upload speed for transmitting data packets. We suggest flipping DIP switch 3 Up (OFF) at a distance of 1,500 feet or less.

- Switch 4: Signal-to-noise Noise Ratio (SNR)
  9dB – Up / Off Position
  6dB – Down / On Position (Default)
  Signal-to-noise ratio is a measurement that refers to how much noise is in the output of a device, in relation to the signal level. If you experience issues of noise bleeding over the lines, or high interference in your environment, it is suggested that you switch to 6dB SNR and change to Interleaved channel. This may help clean up any noise bleeding over your cabling.

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TECHNICAL SUPPORT

Enable-IT, Inc.'s Customer Care Team support is available directly to customers and distributors. All support requests are processed through the online support portal. This allows us to provide assigned support ticket numbers in order to bring closure to any technical issues.

Online Technical Services

The Enable-IT Support Portal is available 24/7 to open a ticket or check the status of one. Please use this support website as your first source for help as it contains an on-line knowledge base of articles, documentation, FAQ's and other problem-solving resources. This web-based support resource provides the quickest solution to the most common technical support issues.

World Wide Web Site

http://support.enableit.com

Returning Products for Warranty Repair

Enable-IT, Inc. warrants to the original purchaser of the Product ("you" or the "End User") that, for the four (4) year period commencing on the date the Product was purchased (the "Warranty Period"), the Product will be substantially free from defects in materials and workmanship under normal use and conditions. **Electrical damage is not an item that is covered under this warranty, extended warranties or Advanced REplacement Program (AREP).**

In order to obtain an authorized RMA approval, the End User must complete the required information online located at http://support.enableit.com. If you have questions or difficulty completing this information you may contact the Customer Care Team at 888-309-0910 between the hours of 8:00 a.m. and 5:00 p.m. PT.

Please ship Authorized RMAs to:

Enable-IT Processing Facility
16600 Harbor Blvd, Suite I
Fountain Valley, CA 92708-1363

Returning Products for Refund

Enable-IT, Inc. offers a generous 45-Day refund on a single Ethernet Extender Kit only, and is subject to a 15% Restocking Fee. Shipments without a valid or authorized RMA number, or sent to our corporate Las Vegas address, can be refused and / or billed for additional shipping.

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ENABLE-IT, INC. LIMITED WARRANTY

Enable-IT, Inc. warrants the Enable-IT 864P Mini Extended Ethernet PoE DSLAM solely pursuant to the following terms and conditions.

1. PRODUCT WARRANTY.

a. Express Warranty.

Enable-IT warrants to the original purchaser of the Product ("you" or the "End User") that, for the four (4) year period commencing on the date the Product was purchased (the "Warranty Period"), the Product will be substantially free from defects in materials and workmanship under normal use and conditions. This warranty does not apply to Products, which are resold as used, repaired or reconditioned, or consumables (such as batteries) supplied with the Product. **Electrical damage is not an item that is covered under this warranty or extended warranties.** Enable-IT does not make any warranty with respect to any third party product, software or accessory supplied with or used in connection with the Product and such third party products, software and accessories, if any, are provided "AS IS." Warranty claims related to such third party products, software and accessories must be made to the applicable third party manufacturer.

b. Remedies for Breach of Warranty.

In the event of a breach of the foregoing warranty, Enable-IT will, in its sole discretion and at its cost, and subject to the terms of the following paragraph, repair the non-conforming Product, replace the non-conforming Product with a new or reconditioned Product or refund the purchase price for the Product. Any new or reconditioned Product provided pursuant to this paragraph is warranted as provided herein for the remainder of the original Warranty Period. THE REMEDY SET FORTH IN THIS PARAGRAPH SHALL BE THE END USER'S SOLE AND EXCLUSIVE REMEDY FOR BREACH OF THE FOREGOING WARRANTY.

c. Conditions for Warranty Qualification.

If authorized by Enable-IT to return a Product which does not conform to the warranty set forth above, the End User must: (1) obtain a return materials authorization (RMA) number from Enable-IT by contacting the Customer Service Dept. at 888-309-0910 between the hours of 8:00 a.m. and 5:00 p.m. PST and otherwise fully comply with Enable-IT's then-current RMA policy; (2) return the Product to Enable-IT in its original packaging freight pre-paid; and (3) provide to Enable-IT the original receipt or bill of sale establishing the date on which the Product was purchased. Products returned to Enable-IT without an RMA number will be returned to the End User. Enable-IT shall not be responsible for damage or loss during shipment of the returned Product to Enable-IT.

d. Voiding of Warranty.

The express warranty set forth above shall not apply to failure of the Product if the Product has been subjected to: (i) physical abuse, misuse, improper installation, abnormal use, power failure or surge, or use not consistent with the operating instructions provided by Enable-IT; (ii) modification (including but not limited to opening the Product housing) or repair by any party in any manner other than as approved by Enable-IT in writing; (iii) fraud, tampering, unusual physical or electrical stress, unsuitable operating or physical conditions, negligence or accidents; (iv) removal or alteration of the Product serial number tag; (v) improper packaging of Product returns; or (vi) damage during shipment (other than during the original shipment of the Product to the End User from Enable-IT, if applicable).

e. Warranty Disclaimers.

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